WRAP-UP and TAKEAWAYS

NOAA RESEARCH

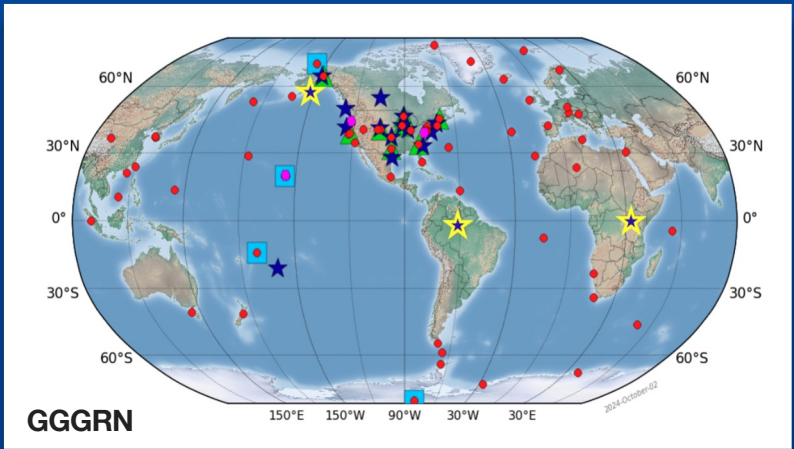
Dr. Vanda Grubišić, Director

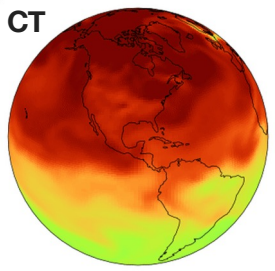
Review Questions

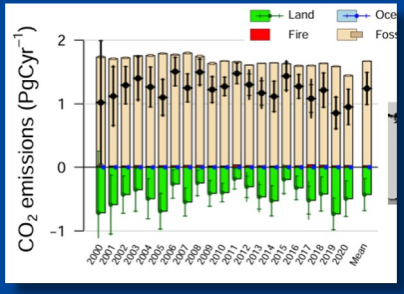
Q1

GML has been pursuing research under the three main research themes (Tracking Greenhouse Gases and Understanding Carbon Cycle Feedbacks, Guiding Recovery of Stratospheric Ozone, and Monitoring and Understanding Trends in Radiation, Clouds & Aerosols). Is the information provided by GML under these themes relevant and appropriate for diagnosing key aspects of Earth's climate system, for reducing uncertainties within it, and for addressing societal challenges associated with a changing climate?

Theme 1
Greenhouse Gases

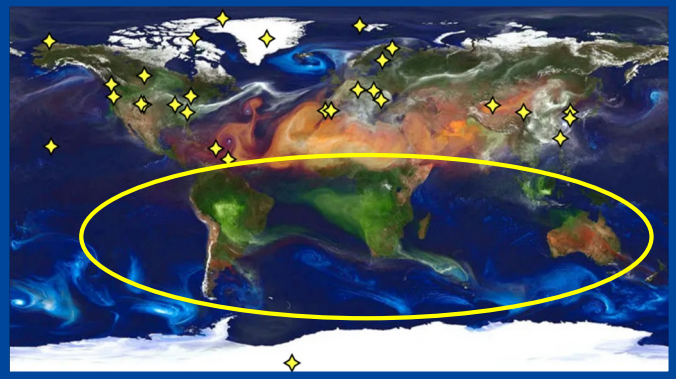


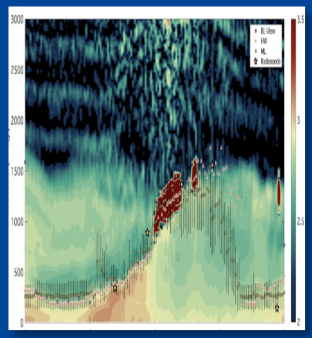


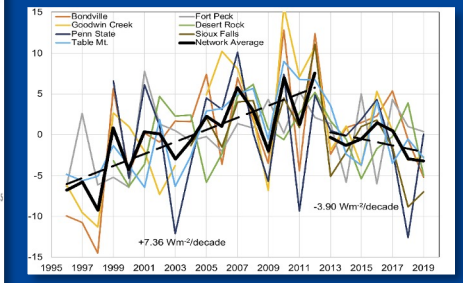


1. GML is a world leader in GHG measurements and their interpretation. Quality and breadth of Global Greenhouse Gas Reference Network (GGGRN) record is distinguished by both global and regional coverage (US & climate sensitive regions). Comprehensive, long-term, well-calibrated.
2. CarbonTracker (CT) data assimilation system provides regional and global analyses of GGGRN data and enables process understanding and source sector attribution (via estimates of emissions and removals).
3. GML aims to advance the state of GHG science and support US and international climate mitigation efforts.

Theme 2
Aerosols and Radiation

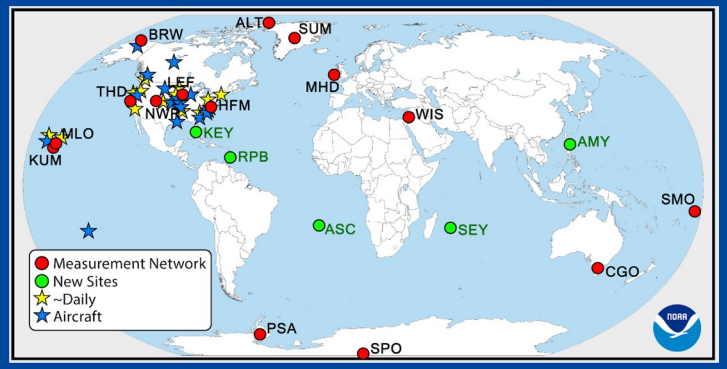


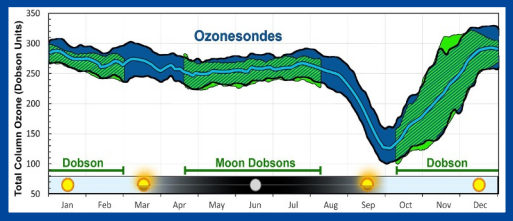


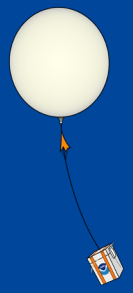


1. GML is a global leader in long-term aerosol and surface radiation measurements and science.
2. Excellence of long-term records of aerosols and surface radiation measurements from our networks (NFAN, SURFRAD, SOLRAD) enables diagnosis of anthropogenic influences and natural/internal variability to reduce climate uncertainties and understand processes.
3. High-quality data widely used and expertise sought to help address societal challenges (improve weather forecasts, renewable energy, wildfire research, etc.)

Theme 3
Ozone & Ozone Depleting Substances







1. Quality, breadth, and long-term nature of GML data records allow for critical assessments of the effectiveness of Montreal Protocol to reduce ozone-depleting gas concentrations, of progress being achieved towards the recovery of the stratospheric ozone layer, and to advance our understanding of atmospheric processes relevant to climate, ozone, and air quality.
2. GML ozonesonde observations at the South Pole are the only measurement found reliably within the ozone hole and the only measurement that reports on the vertical structure of the ozone hole from top to bottom.
3. GML provides scientific and engineering advances that enhance our understanding of atmospheric ozone and its changes over time.

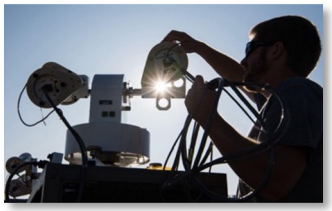
Review Questions

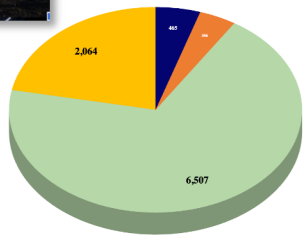
Q2

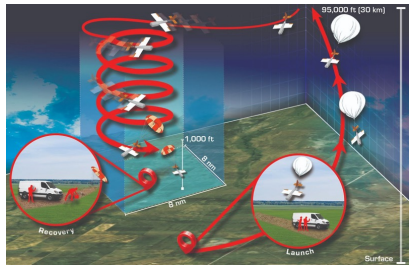
Are the three supporting pillars within GML (Sustained Observations, Standards, Technological Innovation) well structured and resourced, allowing GML to continue making progress towards reaching its strategic objectives?

Three Pillars:

Observatories & Networks, Standards & Calibrations, Technological Innovation







- **Observatories and Network Support**
  - Tackling ABO deferred maintenance
  - Investing in measurement infrastructure through facility and instrument modernization
- **Standards and Calibration**
  - An important role at GML and around the world
  - Support long-term, high-quality measurements, and efforts to meet network compatibility goals
  - Provide references for satellite products
- **Technological Innovation**
  - GML continues to be a global leader in technology development of GHG sampling, analysis and products
  - Technological innovations continue to be explored and implemented without compromising long-term consistency.

Review Questions

Q3

Are GML's datasets easily findable, accessible, interoperable, and reusable, and its data products relevant for stakeholders? Are the data management activities optimally organized?

Fourth Pillar: Data Management

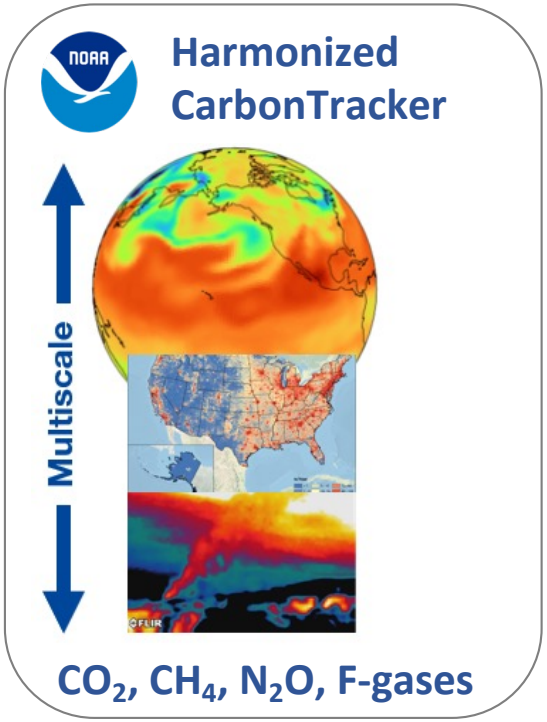
- Community leaders in making our data available and easy to use
- FAIR data distribution provided via National Center for Environmental Information (NCEI) archives

- Mature data management practices honed from decades of operations
- Provision of DOIs for most of our data sets
- All of the GML data available on the GML website, most submitted to national and international archives

Review Questions

Q4

What are potential solutions and strategies that GML should explore as part of its efforts to enhance its current capabilities and create routine, reliable, and robust greenhouse gas (GHG) monitoring and information systems in a sustainable manner to address national and international needs for GHGMMIS (GHG measurements, monitoring and information systems)?



- Filling data gaps through efforts such as GHG measurements by commercial aircraft
- Enabling comparability between remote sensing and ground-based measurements through AirCore and other developments to improve vertical profiles and the link between direct and indirect measurements of GHGs
- Enhancing analysis systems through further development of modeling systems with underlying data assimilation:
  - Enhanced accuracy in transport
  - Enhanced data types and volume
  - Better representation of key processes driving GHG emissions
- Product development
  - Harmonization/Interoperability
  - Operationalize/Low-latency
  - Consensus Flux Estimates

Review Questions

Q5

GML has made progress in recent years in improving the diversity of our workforce. What other actions are recommended to accelerate further progress in building a diverse workforce that is more representative of the U.S. workforce population? How could GML more effectively integrate participation from diverse communities and disciplines and enable our research to more directly benefit society in addressing challenges associated with climate change?

DEIA: Fostering an inclusive and equitable workforce and workplace environment

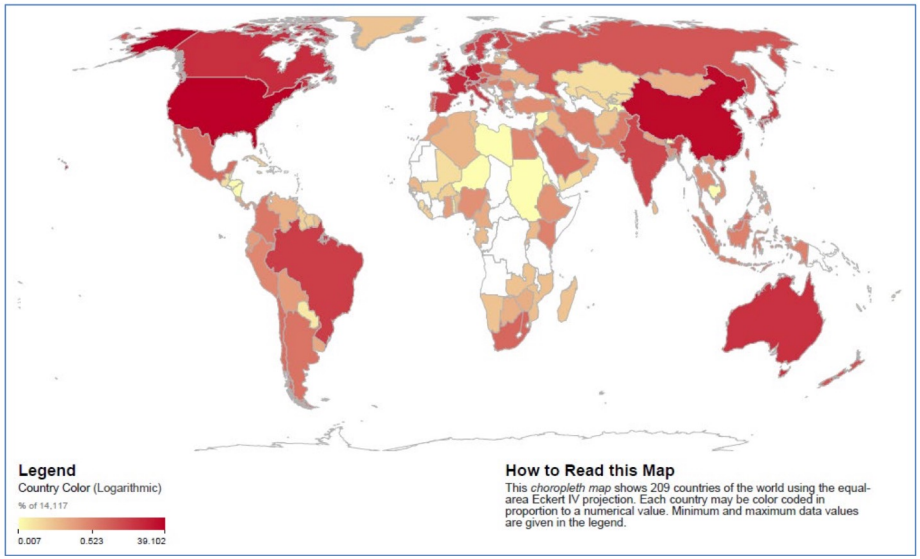
1) Building stronger ties with Cooperative Science Center (CSC) institutions to increase the number of students, interns, early career staff and diversity.
2) Connecting with the communities where we make measurements.
3) Foster engagement with NOAA internship programs (William M. Lapenta Student Internship Program, Earnest F. Hollings Undergraduate Scholarship, Jose Serrano Educational Partnership Program with Minority Serving Institutions (EPP/MSI), NOAA Experiential Research and Training Opportunities (NERTO))

Review Criteria

- Quality
- Relevance
- Performance

Quality

445 publications 20,690 citations *h*-index = 58

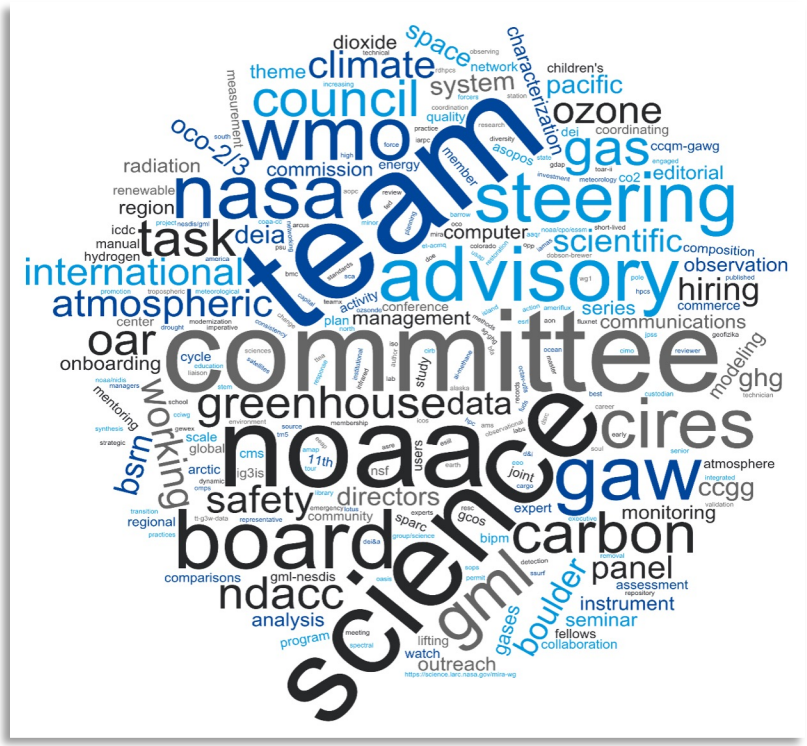


2018-2023

Citations of GML journal publications

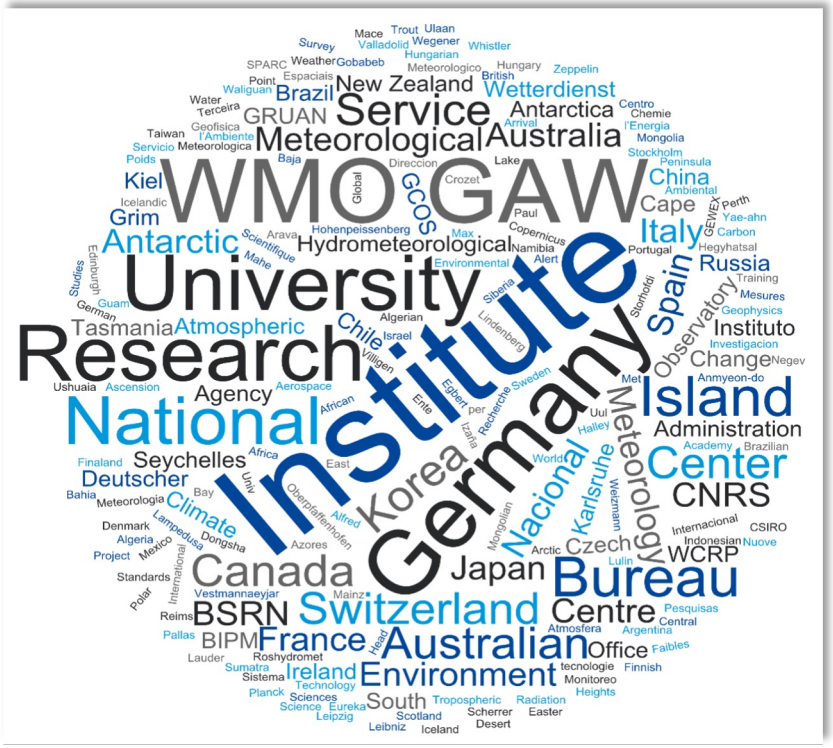
Awards: DOC, NOAA, OAR, Other

Relevance



Professional Service

International Collaboration



Performance

GML is a strongly motivated team working effectively together to fulfill our mission and bring our vision to life!

Thank You's

- GML Presenters
- GML Administrative and IT Support
- GML Comms, Web, and Graphics Teams
- NOAA Library
- GML Review Planning Team
- OAR Boulder OED
- OAR Strategic Management Team
- OAR Lab and Program Colleagues
- Other NOAA Line Office Representatives
- Stakeholders
- OAR Leadership, John Cortinas and Steve Thur
- Review Panel

NOAA RESEARCH

Thank You All!